

Customer No. 24498
Serial No.: 10/584,368
Office Action dated: 04/21/08
Response dated: 07/21/08

PATENT
PU030338

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Listing and Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A temperature control apparatus, comprising:

a fan, including:

a field winding {F3};

a speed controller for providing a speed control signal to said field winding {F3} responsive to a first control signal to control a rotating speed of said fan;

first and second inputs for enabling operating power to be provided to said field winding {F3} and said speed controller, at least one of said first and second inputs being operatively coupled to a first voltage source; and

a third input for providing said first control signal to said speed controller, said third input being operatively coupled to a second voltage source;

temperature measuring means for measuring a temperature and providing a temperature indicating signal indicating said measured temperature;

processing means for providing a second control signal responsive to said temperature indicating signal; and

~~control means for providing said first control signal to said third input (3) of said fan responsive to said second control signal~~

pulse generating means for generating pulses responsive to said second control signal;

first switching means for switching on and off responsive to said pulses to provide an output signal corresponding to said first control signal via a first conducting terminal, said first switching means having a second conducting terminal operatively coupled to said pulse generating means for receiving said pulses and a third conducting terminal operatively coupled to ground;

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a first resistor having a first terminal operatively coupled to said first conduction terminal of said first switching means and a second terminal operatively coupled to the third input of said fan; and

a second resistor having a first terminal operatively coupled to ground and a second terminal operatively coupled to said second terminal of said first resistor, wherein
said first control signal is a current signal, and a circuit formed by the second voltage source and the second resistor provides a predefined current signal to the third input terminal to control said rotating speed to a predefined speed corresponding to a minimal speed.

2-5. (canceled)

6. (currently amended) The temperature control apparatus of claim 1 5, further comprising wherein said control means further comprises a capacitor (C1) having a first terminal operatively coupled to ground and a second terminal operatively coupled to said second terminal of said second resistor (R2).

7. (currently amended) The temperature control apparatus of claim 1 2, further comprising second switching means ~~(Q2)~~ having a first conducting terminal operatively coupled to said second input of said fan and a second conducting terminal operatively coupled to said processing means for receiving a third control signal to turn said fan on and off.

8. (currently amended) A method for controlling temperature, comprising steps of:

providing a fan having a field winding, a speed controller for providing a speed control signal to said field winding responsive to a first control signal to control a rotating speed of said fan, first and second inputs for enabling operating power to be provided to said field winding and said speed controller, and a third input for providing said first control signal to said speed controller, at least one of said first and second inputs being operatively

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coupled to a first voltage source, and said third input being operatively coupled to a second voltage source;

measuring a temperature and providing a temperature indicating signal indicating said measured temperature;

providing a second control signal responsive to said temperature indicating signal; and

providing said first control signal to said third input of said fan responsive to said second control signal; and

providing a third control signal to turn said fan on and off.

9. (original) The method of claim 8, further comprising the steps of:

generating pulses responsive to said second control signal; and

providing said first control signal to said third input of said fan responsive to said pulses.

10. (canceled)

11. (original) The method of claim ~~8~~ 40, wherein said fan is turned on if said measured temperature exceeds a threshold for a predetermined number of consecutive readings.

12. (original) The method of claim ~~8~~ 40, wherein said fan is turned off if said rotating speed of said fan is at a minimum speed, and said measured temperature is less than a threshold by a predetermined limit.

13. (original) The method of claim 8, wherein said rotating speed of said fan is increased if said measured temperature exceeds a threshold for a predetermined number of consecutive readings.

14. (original) The method of claim 8, wherein said rotating speed of said fan is decreased if said measured temperature decreases for a predetermined number of consecutive readings.

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15. (currently amended) A device including a temperature control apparatus, said temperature control apparatus comprising:

a fan, including:

a field winding (F3);

a speed controller for providing a speed control signal to said field winding (F3) responsive to a first control signal to control a rotating speed of said fan;

first and second inputs for enabling operating power to be provided to said field winding (F3) and said speed controller, at least one of said first and second inputs being operatively coupled to a first voltage source; and

a third input for providing said first control signal to said speed controller, said third input being operatively coupled to a second voltage source;

a temperature measuring circuit operative to measure a temperature and provide a temperature indicating signal indicating said measured temperature;

a processor operative to provide a second control signal responsive to said temperature indicating signal; and

~~control circuitry operative to provide said first control signal to said third input of said fan responsive to said second control signal~~

a pulse generator operative to generate pulses responsive to said second control signal;

a first switch operative to switch on and off responsive to said pulses to provide an output signal corresponding to said first control signal via a first conducting terminal, said first switch having a second conducting terminal operatively coupled to said pulse generator for receiving said pulses and a third conducting terminal operatively coupled to ground;

a first resistor having a first terminal operatively coupled to said first conduction terminal of said first switch and a second terminal operatively coupled to said third input of said fan; and

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a second resistor having a first terminal operatively coupled to ground and a second terminal operatively coupled to said second terminal of said first resistor, wherein
said first control signal is a current signal, and a circuit formed by the second voltage source and the second resistor provides a predefined current signal to the third input terminal to control said rotating speed to a predefined speed corresponding to a minimal speed.

16-19. (canceled)

20. (currently amended) The device of claim 15 ~~49~~, further comprising wherein said control circuitry further comprises a capacitor (C1) having a first terminal operatively coupled to ground and a second terminal operatively coupled to said second terminal of said second resistor (R2).

21. (currently amended) The device of claim 15 ~~46~~, further comprising a second switch (Q2) having a first conducting terminal operatively coupled to said second input of said fan and a second conducting terminal operatively coupled to said processor for receiving a third control signal to turn said fan on and off.